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January 11, 1995

Mr. Bill Davis WILLIAMSON PRINTING CORPORATION 6700 Denton Drive Dallas, TX 75235

Re: IN-LINE LITHOGRAPHIC PRINTING PROCESS

Dear Bill:

This letter sets forth the background of the prior art and the advantages of the new in-line lithographic printing process that we discussed on January 5 and that (1) is a continuous in-line process, (2) improves the density of the ink applied to the substrate, and (3) allows liquids in suspension (i.e., scratch and sniff) to be applied to the substrate in the in-line process.

In typical lithographic printing processes, an in-line process cannot be used to apply ink or flexographic (opaque) ink, such as white, to a substrate in dense layers. First, because the plate cylinder is in contact with the blanket cylinder that subsequently transfers the image to the impression cylinder, the plate cylinder takes some of the paint away from the blanket cylinder, thus leaving a smaller amount for application to the impression cylinder. Under such circumstances, several passes or runs of the substrate may have had to be made through the offset lithographic process to cause the white color to be sufficiently strong and dense to be clearly visible. Secondly, a drying time had to be introduced between the multiple runs to allow the ink to dry. Further, to apply strong metallic colors or suspension-type liquids (i.e., scratch and sniff) the process had to be done in large quantities using a web offset process or in small quantities using a silk screen process. Both of these processes are expensive and time consuming.

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The present invention provides a continuous, in-line printing process that enables metallic ink, flexographic ink, scratch and sniff slurries and other water based opaque ink, which normally would require several passes or runs to reach the proper density, to be accomplished in one in-line process.

The system includes multiple stage lithographic offset presses having a least one coater stage as the last stage for applying a transparent coating to the printed substrate. In this process, at the stage where the strong metallic color or color that needs increased density is to be applied, a cartridge coater, such as an EZ Coater, is attached that has an anilox roller (grooved) that will allow larger amounts of liquid color to be applied to the appropriate roller. The coater can apply the fluid to either the plate cylinder or the blanket cylinder. Flexo ink is used (a quick drying ink) and the blanket cylinder utilizes a relief plate instead of the normal flat plate. At the impression cylinder, a high velocity hot air dryer is attached so as to dry the ink applied to the impression cylinder at that stage. Thus, with the use of the anilox roller and the blanket cylinder relief plate, a heaver coating of the quick drying ink can be applied and the ink will be dried at the impression roller.

If a still higher density of ink is to be applied to the plate or blanket cylinder, two or more stages in succession can use the same apparatus for increasing the density of the ink applied to the substrate.

Further, with the use of the anilox roller and the EZ Coater, at one of the last stages, a suspension-type fluid can be applied to the substrate. For instance, a "scratch and sniff" ink can be applied after the coating has been applied to the substrate.

Thus, with such a process, using the EZ Coater to apply a flexographic density liquid ink to the blanket cylinder having a relief plate thereon, the ink can be applied in a thicker layer. Because the flexographic ink is a quick drying ink and because a high velocity dryer is associated with the impression roller, the process can be a continuous one in which the substrate is passed directly from one stage to the other for printing.

Further, with this system, using either a cartridge coater or conventional coater, an opaque layer of metallic flexographic-style ink can be applied to a relief plate in a continuous in-line process.

In conducting a patent search, it seems that the critical elements for which a search should be made could include:

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- 1. an in-line lithographic process;
- 2. in which the blanket roller uses a relief plate;
- 3. to which is applied a flexographic or dense liquid ink;
- 4. an anilox (grooved) roller is used to apply the ink;
- 5. a high velocity dryer is associated with the impression roller to dry the flexographic ink applied to the substrate on the impression cylinder;
- 6. using an EZ Coater having an anilox roller, a suspension-type fluid (scratch and sniff) can be applied at any desired stage, but preferably at the last stage; and
- 7. an additional item of importance is the application of the flexographic ink by the EZ Coater to either the plate cylinder or the blanket cylinder having the relief plate thereon. By applying the ink directly to the relief plate on the blanket cylinder, a greater density ink will be applied to the substrate on the impression cylinder.

Very truly yours,

Alfred E. Hall

cc: Jesse S. Williamson, President John P. Pinkerton, Esq.